



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,561	01/29/2004	Asako Koike	ASAM.0101	4049
7590 12/09/2008				
REED SMITH LLP 3110 Fairview Park Drive, Suite 1400 Falls Church, VA 22042			EXAMINER PADMANABHAN, KAVITA	
			ART UNIT 2161	PAPER NUMBER
			MAIL DATE 12/09/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/766,561

**Applicant(s)**

KOIKE ET AL.

**Examiner**

Kavita Padmanabhan

**Art Unit**

2161

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 September 2008.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-17 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 29 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/06)  
Paper No(s)/Mail Date \_\_\_\_\_  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Status of Claims*

1. Claims 1-17 are pending.
2. Claims 1, 12, and 16 have been amended.
3. Claims 1-17 are rejected.

### *Claim Rejections - 35 USC § 112*

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claim 12** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claim 12** recites the limitation "said terms" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

The examiner will apply prior art to this claim as best understood in light of the above rejection.

### *Claim Rejections - 35 USC § 103*

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
8. **Claims 1-5, 7-9, 11, and 16-17** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Miller et al.** (US 2002/0091678, hereinafter “Miller”) **in view of Lindh et al.** (WO 03/060766, hereinafter “Lindh”).

In regards to **claim 1**, **Miller** teaches a network drawing system, comprising:

- a first input unit designating a first query having terms belonging to a first category (**Miller; Figure 7, reference character S1; par [0052]** – *“the user enters a set of query objects”*);
- a second input unit designating a second query having terms belonging to a second category (**Miller; Figure 7, reference character S1; par [0052]** – *“the user enters a set of query objects”* – plural means at least a first and a second query are entered and the different queries constitute different categories in that each query clearly belongs to its own category at the least);

- a data storage device storing terms belonging to a third category in a form of a table, the terms of the third category comprising at least terms from the first category and the second category (Miller; par [0045], lines 8-12; par [0054], lines 10-12 – “*The display may include information such as author, frequency tables for occurrence of selected terms in the query, probable status for the object corresponding to the point 54 vis-a-vis the query 33 occurring within the object, confidence factor and the like.*” – teaches tables including terms, probable statuses, confidence factors, etc. and the confidence factors are indicators of a degree of an association; par [0055] – “*determines relationships between each of the data objects in the database and the query objects*”);
- a calculation device which calculates a relationship between the input first query and second query (Miller; par [0054], lines 10-14; par [0055] – “*feature vectors have already been calculated*”, “*determines relationships between each of the data objects in the database and the query objects*” – relationships are determined via calculations); and
- a display device displaying on a screen the plurality of the terms associated with at least one of the first query and the second query (Miller; par [0056], Figs. 3 and 4 – “*the processor 20 projects the relationships calculated*” – the relationships are displayed through a plurality of the terms used in the queries).

Miller does not expressly teach the table including a degree of association of a relationship between the terms of the third category, the relationship between the input first query and second query being *based on the relationship between a plurality of the terms in the table stored in said data storage device that are also associated with at least one of the first query and the second*

*query, and displaying the plurality of the terms as a network connecting the plurality of terms to each other based on a result of calculation made by said calculation device.*

**Lindh** teaches a table including a degree of association of a relationship between terms (**Lindh; page 20, lines 26-27; page 24, lines 25-29; page 25, lines 4-9**), the relationship between an input first term and second term being *based on the relationship between the terms in the table stored in said data storage device that are also associated with at least one of the first query and the second query* (**Lindh; Fig. 12; page 25, lines 4-9; page 31, line 27**), and displaying the terms *as a network connecting the terms to each other based on a result of calculation* (**Lindh; Fig. 12; page 31, line 27- page 32, line 32**).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to implement the system of Miller using the features taught by Lindh, whereby the relationship between the first and second queries would be based on the relationships calculated between the terms of the queries and displayed as a network connecting the plurality of terms of the queries, in order to allow visualization of the relationship between a plurality of terms and enable users to uncover and explore various term and concept relationships that exist in the system (**Lindh; page 32, lines 5-9**).

In regards to **claim 2**, **Miller and Lindh** teach the network drawing system according to claim 1, further comprising

- a third input unit for designating a drawing condition (**Miller; par [0043]; Fig. 7, steps S12, S13, S15**); and

- said network being displayed according to said drawing condition (**Miller; par [0043]; Fig. 4**).

In regards to **claim 3, Miller and Lindh** teach the network drawing system according to claim 1, wherein said data storage device further stores attributes of said terms (**Miller; pars [0031]-[0032], pars [0061] - [0062]**).

In regards to **claim 4, Miller and Lindh** teach the network drawing system according to claim 1, wherein at least one of said first query and said second query includes a plurality of query terms (**Miller; par [0032], lines 1-5**).

In regards to **claim 5, Miller and Lindh** teach the network drawing system according to claim 1, wherein among routes connecting said first query and said second query, a route having the highest degree of a relationship between the first and second category terms is displayed by a highlight line (**Miller; Figs. 3, 4, and 6**).

In regards to **claim 7, Miller and Lindh** teach the network drawing system according to claim 1, wherein the relationship between said terms is extracted according to co-occurrence between terms or phrase patterns (**Miller; par [0031], lines 1-6; par [0032], lines 5-8; par [0045], lines 6-12**).

In regards to **claim 8, Miller and Lindh** teach the network drawing system according to claim 2, wherein the network of the terms is re-displayed interactively by changing the setting of said third input unit (**Miller; par [0043]; par [0047]; par [0059]; Fig. 7, steps S12, S13, S15**).

In regards to **claim 9, Miller and Lindh** teach the network drawing system according to claim 2, wherein the connection between the terms or editing for addition or deletion of a term itself can be conducted interactively by changing the setting of said third input unit (**Miller; par [0043]; par [0047]; Fig. 7, steps S12, S13, S15**).

In regards to **claim 11, Miller and Lindh** teach the network drawing system according to claim 1, wherein the relationship between said terms is displayed on the screen at the same time with other analysis information (**Miller; Figs. 3, 4, and 6**).

**Claim 16** is rejected using the same citations provided for claim 1.

In regards to **claim 17, Miller and Lindh** teach the network drawing method according to claim 16, wherein said data storage device is accessed through an Internet (**Miller; par [0026]; Fig. 2**).

9. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Miller in view of Lindh, further in view of Murray et al.** (US 6,876,930, hereinafter “Murray”).



In regards to **claim 10, Miller and Lindh** teach the network drawing system according to claim 1.

Miller and Lindh do not expressly teach a synonym dictionary for converting at least one query input through said first input unit or said second input unit into a standardized term.

**Murray** teaches querying a database to identify synonyms for genes that are being queried and then proceeding with the search based on the input gene and its identified synonyms (**Fig. 10, steps 300-320**).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to implement the system of Miller and Lindh by using a synonym dictionary to convert an input term into its synonyms, such as that taught by Murray, in order to be able to more accurately depict relationships between terms by using both the input term and its identified synonyms (**Murray; col. 28, lines 1-6**).

10. **Claims 6 and 12-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Miller in view of Lindh, further in view of Chamberlin et al.** (US 6,941,317, hereinafter "Chamberlin").

In regards to **claim 6, Miller and Lindh** teach the network drawing system according to claim 1.

Miller and Lindh do not expressly teach said first category being at least one of a disease name, a symptom, a protein name, a gene name, a compound name, a gene function and a

protein's function; and said second category being at least one of the compound name, the protein name and the gene name.

**Chamberlin** teaches entering queries wherein the keywords are amino acid sequences, gene names, etc. (**Chamberlin; col. 15, line 52 – col. 16, line 28**), in order to perform searches, browse sequences, and examine and display relationships between genes (**Chamberlin; col. 14, lines 9-19**).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to implement the system of Miller and Lindh using the biological queries of Chamberlin in order to be able to query databases containing biological data and display relationships between such data (**Chamberlin; col. 1, lines 25-32; col. 14, lines 9-19**).

In regards to **claim 12**, **Miller and Lindh** teach the network drawing system according to claim 1.

Miller and Lindh do not expressly teach when said terms have hierarchies, said network to connect said queries being drawn using associated concept relationships and upper concept relationships thereof.

**Chamberlin** teaches displaying items in a hierarchical tree (**Chamberlin; Fig. 15**).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to implement the system of Miller and Lindh using the hierarchical display feature of Chamberlin, whereby if terms have a hierarchical relationship, the system of Miller would indicate the hierarchy including upper concept terms in the graphical representation of the

network in order to display relationships between biological data (**Chamberlin; col. 1, lines 25-32; col. 14, lines 9-19**).

In regards to **claim 13**, **Miller and Lindh** teach the network drawing system according to claim 1. **Miller** also teaches displaying information associated with a term on the display (**Miller; par [0045], line 1 – par [0046], line 5; par [0061] – par [0062]**).

Miller and Lindh do not expressly teach said second category being a gene name, and said gene name being displayed along a horizontal axis of said screen, and a lod score generated from a linkage analysis of said result of calculation made by said calculation device being displayed for each gene of the horizontal axis or together with information on a chromosome position.

**Chamberlin** teaches entering queries wherein the keywords are amino acid sequences, gene names, etc. (**Chamberlin; col. 15, line 52 – col. 16, line 28**), a display depicting relationships between sequences (**Chamberlin; Fig. 15**), and displaying a “log odds score” (**Chamberlin; Fig. 11; col. 16, lines 4-10**).

It would have been obvious to one of ordinary skill in the art at the time of the applicant’s invention to implement the system of Miller and Lindh with the biological data of Chamberlin, whereby the second query term is of the gene name category, and the gene name and log odds score information is displayed with the graphical representation of the network in order to display information about and relationships between biological data (**Chamberlin; col. 1, lines 25-32; col. 14, lines 9-19**).

In regards to **claim 14, Miller and Lindh** teach the network drawing system according to claim 1.

Miller and Lindh do not expressly teach the relationship between said terms being displayed together with a result of gene clustering based on gene attributes, wherein the first query or second query is at least a gene with attributes.

**Chamberlin** teaches displaying the relationships between genes and protein sequences and also teaches displaying families of sequences (**Chamberlin; Fig. 11; Fig. 15**), which constitutes clustering or grouping.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to implement the system of Miller and Lindh using the display feature of Chamberlin, whereby relationships between terms would take into account familial and evolutionary relatedness, in order to display relationships between biological data (**Chamberlin; col. 1, lines 25-32; col. 14, lines 9-19**).

In regards to **claim 15, Miller and Lindh** teach the network drawing system according to claim 1. **Miller** also teaches highlighting a route connecting different items, i.e. terms that do not match with each other (**Miller; Fig. 4, Fig. 6**).

Miller and Lindh do not expressly teach when a result of displaying the network is not consistent with a result of the gene clustering, a route connecting the first query and the second query from the result of said calculation which are from a result of mis-clustering is displayed by a highlight line.

**Chamberlin** teaches displaying the relationships between genes and protein sequences and also teaches displaying families of sequences (**Chamberlin; Fig. 11; Fig. 15**), which constitutes clustering or grouping.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to implement the system of Miller and Lindh using the biological data of Chamberlin, whereby when there is not an exact match found because of inadequate clustering, a nearest match could be highlighted on the display to indicate relationships between biological data (**Miller, par [0049]; Chamberlin, col. 1, lines 25-32, col. 14, lines 9-19**).

#### ***Response to Amendment***

11. Applicant's amendments filed 9/2/08 with respect to the 35 U.S.C. 112, 1<sup>st</sup> paragraph rejection have been fully considered. The rejection of claim 12 has been withdrawn accordingly.

12. Applicant's amendments filed 9/2/08 with respect to the 35 U.S.C. 112, 2<sup>nd</sup> paragraph rejections have been fully considered. The rejection of claim 12 based on "said terms" has been maintained, as evidenced above, as applicant has not addressed this rejection either via claim amendments or arguments.

#### ***Response to Arguments***

13. Applicant's arguments filed 9/2/08 with respect to the prior art rejections of the claims have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Kavita Padmanabhan** whose telephone number is **(571)272-8352**. The examiner can normally be reached on Monday-Friday, 9:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Apu Mofiz can be reached on 571-272-4080. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kavita Padmanabhan  
Assistant Examiner  
AU 2161

December 4, 2008

/K. P./

/Apu M Mofiz/  
Supervisory Patent Examiner, Art Unit 2161